

MILITARY CHAFF MAY BE KILLING VALLEY LIGHTNING FIBERS SHORT OUT BOLTS, EXPERTS SAY

Front

Hair-thin fibers released by military jets to evade radar during aerial war games in southern Arizona may be shorting out spectacular monsoon lightning over Phoenix.

Researchers say the fibers, called chaff, float above the state for up to a day, forming huge clouds seen only by weather radar and preventing the huge buildup of energy needed to produce lightning.

Routinely released by fighter jets during war games at the Barry M. Goldwater Range, 65 miles southeast of Phoenix, the chaff consists of hair-thin strands of aluminum-coated fiberglass.

Chaff is blamed for everything from making Nevada cattle sick to posing health risks to those who breathe it in. But the Department of Defense has denied chaff poses health or environmental risks, and even critics point out there is not much solid information on chaff.

Researchers in Arizona have been looking at the chaff-lightning connection since at least 1990. They took special notice of a strange storm that swept out of the south and into the Valley on Aug. 20, 1993. The storm pummeled the Valley with heavy rain, hail and powerful winds. There was even a report of a funnel cloud.

But there was almost no lightning.

LIGHTNING STRIKES ARE FEW

And lightning almost always comes with strong summer storms in Arizona. But this storm packed just one cloud-to-ground lightning strike. A normal storm of that magnitude could have been expected to produce 35 such bolts, according to Tucson research meteorologist Robert Maddox.

"That storm triggered several of us to dig into the data and try to figure out what in the hell was going on," said Maddox, past director of the Severe Storms Laboratory in Norman, Okla., and currently a visiting scientist at the National Weather Service Office in Tucson.

Maddox said he and his colleagues have been perplexed for years over weather records indicating that Phoenix has an unusually low number of lightning strikes for the number of strong monsoon thunderstorms that pass through in July and August.

Maddox took a serious look at the military war games after examining studies conducted 30 years ago by scientists in Boulder, Colo., who experimented with dumping chaff directly into developing thunderstorms.

Maddox, whose research is ongoing, published a study in 1997, and his colleagues documented 11 potent Valley summer storms from 1995 to 1998 that produced no lightning.

He said that so far, researchers have been focusing on the Valley because it's a "natural laboratory." Summer wind currents blow chaff clear across the Valley, settling out at about the McDowell Mountains.

DISCHARGING LIGHTNING

"Chaff has sharp edges that discharge lightning," Maddox said. "The net effect is that the really high electrical charge needed to generate a lightning strike never has a chance to accumulate."

Although chaff floats unseen over the Valley, it shows up vividly on Doppler radar, said Tony Haffer, head meteorologist in the Phoenix office of the National Weather Service.

"It's aggravating," Haffer said. "Chaff tends to make clouds look like they're capable of producing more precipitation than they really are. Sometimes, we're not absolutely sure what is and what is not chaff. It's like the old commercial, 'Is it real or Memorex?' "

Haffer said that when there's doubt, National Weather Service offices do further analysis to determine the true nature of the Doppler signal.

"At times, it's amusing," Haffer said. "We've noticed that some of the local television personalities point to the bogus radar echoes and say there are showers southwest of Phoenix and moving our way. But when you look at the satellite picture, we have clear skies."

Haffer said he'd just like to know when and where the big chaff dumps will occur.

"We've tried to get some idea from the military, but they've been reluctant to share that with us," Haffer said.

2 MILLION FIBERS PER BUNDLE

According to a September 1998 report issued by the General Accounting Office, the investigative arm of Congress, there were 237,975 bundles of chaff released in 1997 during war games at the Goldwater range. There are approximately 2 million fibers per bundle.

The Goldwater range is managed by Luke Air Force Base. Jeff Rothrock, chief of environmental compliance at Luke, said he's not familiar with any kind of problems caused by chaff.

Luke news division chief, Mary Jo May, said she also is unfamiliar with Maddox's chaff research or complaints by the National Weather Service regarding chaff.

Weather experts said Maddox's research holds up.

'PRETTY GOOD CASE'

"I think he makes a pretty good case that it is indeed chaff that is causing the lack of lightning for certain days here in Phoenix," said Randy Cerveny, a geography professor at Arizona State University who specializes in storm meteorology and Arizona monsoons.

Philip Krider, professor of atmospheric sciences at the University of Arizona, also is familiar with Maddox's research.

"Looks to me like it's happening," Krider said.

But it's unclear what's happening beyond the apparent lost light shows.

Maddox said chaff apparently does not affect other elements of a thunderstorm.

Cerveny said lightning does have beneficial aspects, such as splitting nitrogen molecules from oxygen molecules and fixing the nitrogen into the soil.

"This is a major, natural way the earth gets fertilized," Cerveny said.

Cerveny said lightning also corrects an imbalance between positive charges at ground level and negative charges in the cloud. He said there are also studies examining the correlation between lightning strikes and rainfall.

"Right now, we don't know all the ramifications when there's an absence of lightning," Cerveny said.

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